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COMMITTEE OF EXPERTS ON THE
TRANSPORT OF DANGEROUS GOODS

Sub-Committee of Experts on the
Transport of Dangerous Goods
(Fifteenth session,
Geneva, 29 June-10 July 1998,
agenda item 5(g))

MISCELLANEOUS DRAFT AMENDMENTS TO THE MODEL REGULATIONS ON THE TRANSPORT OF DANGEROUS GOODS

Toxic by inhalation substances
Consignment requirements

Transmitted by the Expert from the United States of America

Introduction

1. During the thirteenth and fourteenth sessions, the Sub-Committee considered the issue of amending the Model Regulation to include special requirements for substances that are toxic by inhalation (TIH substances). This topic was discussed on the basis of ST/SG/AC.10/C.3/1997/20 and ST/SG/AC.10/C.3/1997/81 which contained specific proposals for new hazard communication requirements for TIH substances. The intention of proposals on TIH substances is to improve the hazard communication of these substances for purposes of transport acceptance and emergency services personnel, and to improve the packaging of such materials to reduce the likelihood of release in transport. The previous papers provide the justification for why the expert from the United States considers it necessary to adopt additional requirements for this group of substances. To facilitate discussion of this topic, the proposals in the two previous papers are being resubmitted in four separate papers for the fifteenth session. The purpose of this paper is to recommend specific requirements for improving hazard communication with respect to these substances.

2. The proposals are similar to those made previously in ST/SG/AC.10/C.3/1997/81; however, some adjustments to the proposals in ST/SG/AC.10/C.3/1997/81 were made on the basis of the indicative votes held during the fourteenth session.

Definition of TIH substances

3. As now discussed in ST/SG/AC.10/C.3/1998/29 only inhalation toxicity substances of Division 6.1 and gases of Division 2.3 (label proposal only) would be subject to the hazard communication requirements proposed.

NOS Proper shipping names

4. It is proposed that new NOS entries be adopted to better distinguish between Division 6.1 TIH substances that are transported under NOS proper shipping names which meet the inhalation toxicity criteria and those that do not meet the criteria. It is proposed that this distinction be made through the inclusion of the words "Toxic by Inhalation" in each new shipping name. The following new entries are proposed:

(2)	(3)	(4)	(5)	(6)	(7)
TOXIC BY INHALATION LIQUID, N.O.S.	6.1		I	109 274 xxx	NONE
TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S.	6.1	3	I	109 274 xxx	NONE
TOXIC BY INHALATION LIQUID, WATER-REACTIVE, N.O.S.	6.1	4.3	I	109 274 xxx	NONE
TOXIC BY INHALATION LIQUID, OXIDIZING, N.O.S.	6.1	5.1	I	109 274 xxx	NONE
TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S.	6.1	8	I	109 274 xxx	NONE

Each of these entries should have the following special provision indicated in column 6 of the Dangerous Goods list:

> "XXX This entry shall only be used for Division 6.1 substances that meet the inhalation toxicity criteria for Packing Group I described in 2.6.2.2.4.3."

Proposed packaging and portable tank requirements are provided in ST/SG/AC.10/C.3/1998/27 and -28.

5. To prevent existing toxic liquid NOS entries not meeting the inhalation toxicity criteria a special provision indicating that those entries should not be used if the substance meets the TIH criteria should be placed against each such NOS entry which would no longer be appropriate for TIH substances. This special provision should also be placed against several chemical specific entries including UN 1614, 1744, and 3294. The new special provision should read:

> "YYY This entry shall not be used for Division 6.1 substances that meet the inhalation toxicity criteria for Packing Group I described in 2.6.2.2.4.3."

This special provision should appear in column 6 of the Dangerous Goods List against the following entries:

1583,1614, 2810, 2927, 2929, 3122, 3123,3275, 3276,3278,3279,3280,3281,3287, 3289,and 3294.

Labelling and placarding

6. To emergency responders, labels and placards usually provide the first sign that a substance involved in an incident is dangerous and provide information on the nature of the danger posed. For TIH substances, given their ability to evaporate and disperse through the atmosphere, it is particularly important that the responder is able to recognize the type of substance involved at a considerable distance from the sight of the incident.

7. Division 6.1 includes substances that are toxic by oral, dermal and inhalation routes of exposure. The number of TIH substances included in Division 6.1 is small relative to the number of substances included in Division 6.1. Under the current system, not being able to distinguish TIH substances from other Division 6.1 substances could lead to overly cautious and expensive precautionary measures being taken in the event of an incident involving a Division 6.1 substance that does not meet the TIH criteria. Conversely frequent exposure to other Division 6.1 substances could lead to complacency among response personnel resulting in them being insufficiently cautious in the event of an incident involving a TIH substance.

8. The existing Division 2.3 and 6.1 labels and placards are not readily visible from a distance. Further, the expert from the United States considers that a label and placard distinct from the existing Division 6.1 label is necessary to effectively communicate the risk of TIH substances to emergency response personnel. Because Division 2.3 and Division 6.1 substances pose the same type of inhalation hazard risk, it is also proposed that the same label and placard be used for both Division 2.3 and Division 6.1 substances. Proposed labels for TIH liquids and gases are shown in Annex 1. While the proposed labels do not pictorially convey the toxic by inhalation hazard, they are visible from long distances and they are clearly distinct from the label used for other toxic substances. Tests have shown that the label is discernable at a distance of at least 100 metres. As such, they will enable *trained* emergency services personnel to recognize the toxic inhalation hazard the labels and placards are intended to convey.

9. It is proposed that the Class 2.3 label shown in Annex 1 replace label No. 2.3 in 5.2.2.2.2.1 and that the existing No.6.1 label would be redescribed as:

(No. 6.1A)
Division 6.1
Toxic substances other than Packing Group I toxic by inhalation substances

The Division 6.1 label shown in Annex 1 would be added to 5.2.2.2.2.1 as an additional label with the following description:

(No. 6.1B)
Division 6.1
Packing Group I toxic by inhalation substances

Documentation

10. In the case of substances transported under new NOS descriptions, the fact that a substance is a TIH substance will be clear from the proper shipping name that is used. In the case of Division 2.3 gases, it will be clear from the 2.3 Division indicated in the basic description. However, for substances transported under specific shipping names, no information currently required to be provided on the shipping paper conveys the information that the substance is a TIH substance. It is proposed that on shipping papers listing TIH substances under a specific chemical proper shipping name that the words "Toxic by Inhalation" be required to be placed on the shipping paper immediately after the basic description.

11. It is proposed that a new paragraph 5.4.1.1.6 be added (existing 5.4.1.1.6 and subsequent paragraphs renumbered) as follows:

"5.4.1.1.6 *Special provision for Division 6.1 toxic by inhalation substances*

For Division 6.1 substances that meet the vapour inhalation toxicity criteria for Packing Group I (see 2.6.2.2.4.3) that are described on the transport document by a proper shipping name that does not convey that the substance is toxic by inhalation, the words "Toxic by Inhalation" shall be placed immediately following the basic description required by 5.4.1.1.1."

Identification of substances meeting the inhalation criteria for Division 6.1, Packing group I

12. To identify those named substances to which the proposed new Division 6.1 label, and the proposed transport document provision would apply, it is proposed that a new special provision be added in column 6 of the Dangerous Goods List as follows:

> "ZZZ This substance is considered to meet the inhalation toxicity criteria of Division 6.1, Packing Group I. The model No. 6.1B label and placard shall be used and the substance shall be described on the transport document in accordance with 5.4.1.1.6."

Note: For the NOS descriptions, special provision XXX could be modified to include the following: "Model No. 6.1B labels and placards shall be used."

13. List of substances which the expert from the United States considers as meeting these criteria are provided in ST/SG/AC.10/1998/29. It is proposed that special provision ZZZ be placed against each of these substances.

ANNEX 1

LABEL

6

Annex

List of substances in the United Nations' Dangerous Goods List
known to be toxic by inhalation

LIST OF GROUP IA SUBSTANCES							
UN NO.	***SUBSTANCE***	***LC50 (ppm)***	***LCLo (ppm)***	***NOTE***	***V (20° C) (ppm)***	***NOTE***	***RTECS*****
UN 2484	tert-Butyl isocyanate	22	–	A	19700		NQ8300
UN 1745	Bromine pentafluoride	–	50	eS	453000		EF9350
UN 1744	Bromine	113	–	R*[illegible]	237000		EF9100
UN 1092	Acrolein, inhibited	25	–	D	289000		AS1050
UN 1834	Sulfuryl chloride	131	–	C	142000		WT4870
UN 2482	n-Propyl isocyanate	44	–	A	69700		NR0190
UN 1380	Pentaborane	12	–	R*	225000		RY8925
UN 1259	Nickel carbonyl	18	–	R*	422000		QR6300
UN 1251	Methyl vinyl ketone, stabilized	5	–	C*	93400		EM9800
UN 2480	Methyl isocyanate	22	–	A*	458000		NQ9450
UN 1244	Methylhydrazine	68	–	R*	50300		MV5600
UN 1185	Ethyleneimine, inhibited	76	–	R*	217000		KX5075
UN 2481	Ethyl isocyanate	–	–	14	–		NQ8825
UN 1239	Methyl chloromethyl ether	160	–	R*	210000		KN6650
UN 1238	Methyl chloroformate	88	–	R	135000		PG3675
UN 2605	Methoxymethyl isocyanate	–	–	14	–		NQ9240
UN 1051	Hydrogen cyanide, stabilized	40	–	R*	842000		MW6825
UN 2483	Isopropyl isocyanate	–	–	14	–		NQ9230
UN 2486	Isobutyl isocyanate	–	–	14	–		NQ9208
UN 1994	Iron pentacarbonyl	6	–	R?	30300		NO4900